

NewsRelease

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Video Games May Lead To Better Health Through New NASA Technology

For decades doctors have used biofeedback as a way to help control stress and tension. Now NASA technology adds a new twist by combining this mind-over-matter technique with the hand-eye coordination of video games.

According to researchers at NASA's Langley Research Center in Hampton, Va., the results may actually improve and protect a player's mental and physical health.

This unique interactive system, tested at Eastern Virginia Medical School (EVMS) in Norfolk, Va., trains people to change their brainwave activity or other physiological functions while playing popular off-the-shelf video games. This is accomplished by making the video game respond to the activity of the player's body and brain.

"Thirty years of biofeedback research has shown that by training specific brainwave changes, or reductions in other abnormal physiological signals, people can achieve a wide variety of health-enhancing outcomes," said Dr. Olafur Palsson, assistant professor of psychiatry and family medicine at EVMS. "With this new technology, we have found a way to package this training in an enjoyable and inherently motivating activity."

Signals from sensors attached to the player's head and body are fed through a signal-processing unit to a video game joystick or other control device. As the player's brainwaves come closer to an optimal, stress-free pattern, the video game's joystick becomes easier to control. This encourages the player to produce these patterns or signals to succeed at the game.

In this way, recreational video games have the potential to help both children and adults with a variety of health problems -- from concentration difficulties to physical stress.

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Unlike earlier biofeedback methods, which tended to be monotonous and simplistic, this technology adapts to today's most popular games, giving players a healthful side effect, while fully preserving the high-tech entertainment value.

"This technology is a spin-off of NASA research where we measure the brain activity of pilots in flight simulators," added co-inventor Alan Pope, Ph.D., of Langley's Crew/Vehicle Integration Branch. "Flight simulators are essentially very sophisticated video games." Pope is an adjunct research assistant professor in psychiatry and behavioral sciences at EVMS.

In addition, in what could be called a "spin-back" application, NASA is studying ways to use the technology for pilot training.

Early results from a video game biofeedback study suggest that the technology is effective. In this first test, to be completed this fall, the technology is being applied as a treatment for attention deficit hyperactivity disorder (ADHD). Children with ADHD, between the ages of 9 and 14, either play popular video games or receive more traditional brainwave biofeedback treatment. Both forms of treatment help the children's symptoms, but the video game treatment seems to have distinct advantages.

"The main difference we see between the groups so far is in motivation -- the children in the video game group enjoy the sessions more and it is easier for the parents to get them to come to our clinic," said Dr. Palsson, principal investigator in the study and co-inventor of the technology.

"This technology could be in homes all over the country within the next two or three years," according to David Shannon of Langley's commercialization office. "Several companies have applied for a license to produce training systems for the general public."

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NOTE TO EDITORS: Still images are available from Keith Henry at h.k.henry@larc.nasa.gov and video from Kim Land at k.w.land@larc.nasa.gov or 757/864-9885.

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